

II. LISTING OF THE CLAIMS

The following listing of claims replaces all prior versions, and listings, of claims in the application:

1. (Currently Amended) A cleaner for removing particles from a surface by propelling a fluid onto the surface, the cleaner comprising:

at least one partition adjacent a fluid nozzle, each of the at least one

partition defining:

a central cavity configured to define the fluid departing the surface into a first vortex;

a side cavity laterally adjacent the central cavity configured to define fluid escaping from the central cavity into a second vortex; and

wherein ~~a main body of~~ the first vortex and ~~a main body of~~ the second vortex ~~are~~ fluidly interconnected interact with one another.

2. (Original) The cleaner of claim 1, wherein the fluid nozzle propels the fluid substantially perpendicular onto the surface.

3. (Currently Amended) The cleaner of claim 1, wherein ~~each~~ the side cavity is coupled to a vacuum to remove at least part of the escaping fluid to remove particles.

4. (Original) The cleaner of claim 3, wherein a vacuum volume is greater than ninety percent (90%) of a fluid nozzle delivery volume.

5. (Currently Amended) The cleaner of claim 1, wherein each of the at least one partition is distanced from the surface by a partition distance, and the fluid nozzle is distanced from the surface by a nozzle standoff distance.

6. (Currently Amended) The cleaner of claim 5, wherein the partition distance is less than a distance from a centerline of the fluid nozzle to each of the at least one the partition.

7. (Original) The cleaner of claim 5, wherein the nozzle standoff distance is no less than 1.2 times the partition distance and no greater than twice the partition distance.

8. (Original) The cleaner of claim 5, wherein a Reynolds number based on a fluid velocity as a reference velocity and the partition distance as a reference distance is no less than 7,500 and no greater than 20,000.

9. (Currently Amended) The cleaner of claim 5, wherein a distance from a centerline of the fluid nozzle to each of the at least one partition is greater than five times an inner diameter of the fluid nozzle.

10. (Currently Amended) The cleaner of claim 5, wherein a ratio of a lateral distance of each the side cavity to the partition distance is greater than 10, and wherein the lateral distance of each the side cavity is measured between a partition and a vacuum entry.

11. (Currently Amended) The cleaner of claim 1, wherein the central cavity forms an angle with the horizontal at each of the at least one partition of greater than 0° and less than 65°, and ~~each~~ the side cavity forms an angle with the horizontal at each partition of greater than 20° and less than 90°.

12. (Original) The cleaner of claim 1, wherein the central cavity forms an angle relative to a vertical edge of the fluid nozzle of no less than 80° and no greater than 135°.

13. (Currently Amended) The cleaner of claim 1, wherein ~~each~~ the second vortex has a larger diameter and less energy than the first vortex.

14. (Original) The cleaner of claim 1, wherein the cleaner is placed above the surface.

15. (Currently Amended) The cleaner of claim 1, wherein ~~each~~ the central cavity and the side cavity both extend[[s]] in a planar fashion.

16. (Currently Amended) A cleaner for removing particles from a surface by propelling a fluid against the surface, the cleaner comprising:

means for delivering a fluid under pressure to an area on the surface;

means for forming fluid departing the surface into at least one first vortex

adjacent the area and in contact with the surface, and at least one second vortex adjacent each of the at least one first vortex and in contact with the surface; and means for evacuating particles by removing a part of ~~the~~ each of the at least one second vortex.

17. (Currently Amended) The cleaner of claim 16, wherein the at least one first vortex and the at least one second vortex ~~vortices~~ are counter-rotating relative to one another.

18. (Currently Amended) The cleaner of claim 16, wherein each of the at least one second vortex has a larger diameter and less energy than a respective first vortex.

19. (Currently Amended) A method for removing particles from a surface by propelling a fluid against the surface, the method comprising the steps of:
delivering a fluid under pressure to an area on the surface;
forming fluid departing the surface into at least one first vortex adjacent the area and in contact with the surface, and at least one second vortex adjacent each of the at least one first vortex and in contact with the surface; and
removing particles by removing at least part of ~~the~~ each of the at least one second vortex.

20. (Currently Amended) The method of claim 19, wherein the forming step includes forming each of the at least one second vortex to have a larger diameter and less energy

than a respective first vortex.